

In the claims:

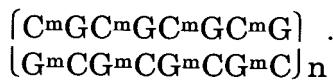
Claims 1-31 (deleted).

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32. (New) A method for treating cancer, for restoring an aberrant methylation pattern in a patient DNA, or for changing a methylation pattern in a patient DNA comprising the step of administering to a patient in need thereof a therapeutically effective amount of an antagonist or inhibitor of DNA demethylase, said DNA demethylase comprising amino acids 150-411 of SEQ ID NO.:2, or a homologue thereof.

33. (New) The method according to claim 32, wherein said antagonist is a double stranded oligonucleotide that inhibits demethylase at a Ki of 50nM.

34. (New) The method according to claim 33, wherein said oligonucleotide is



35. (New) The method according to claim 32, wherein the inhibitor comprises an anti-DNA demethylase antibody or an antisense oligonucleotide of DNA demethylase or a small molecule.

36. (New) The method according to one of claims 32, wherein a change of the methylation pattern activates a silent gene.

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37. (New) The method according to claim 36, wherein activation of the silent gene permits the correction of a genetic defect.

38. (New) The method according to claim 37, wherein said genetic defect is  $\beta$ -thalassemia or sickle cell anemia.